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(REV. 5-93)U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICEATTORNEY'S DOCKET NUMBER  
22750/493**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

**09/890706**INTERNATIONAL APPLICATION NO.  
**PCT/EP00/00940**INTERNATIONAL FILING DATE  
(07.02.00)  
07 February 2000PRIORITY DATES CLAIMED  
(06.02.99)  
06 February 1999

TITLE OF INVENTION

**A SHOE, IN PARTICULAR A SHOE FOR SMALL CHILDREN**

APPLICANT(S) FOR DO/EO/US

**LAUER, Peter; AUGUSTIN, Hubert; KLEIN, Ernst and SCHRÖDER, Josef**

Applicants herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) immediately rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (Unexecuted)
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

**Items 11. to 16. below concern other document(s) or information included:**

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.  
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☒ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: An English translation of the International Search Report; An English translation of the International Preliminary Examination Report; Marked-up version of the Substitute Specification; two (2) sheets of formal drawings and first page of the published International Application WO 00/45660.

EXPRESS MAIL NO. : EL244502942US

17. ☒ The following fees are submitted:**Basic National Fee (37 CFR 1.492(a)(1)-(5)):**

Search Report has been prepared by the EPO or JPO ..... \$860.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) ... \$690.00

No international preliminary examination fee paid to USPTO (37 CFR 1.482) but  
international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... \$710.00Neither international preliminary examination fee (37 CFR 1.482) nor international  
search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$1,000.00International preliminary examination fee paid to USPTO (37 CFR 1.482) and all  
claims satisfied provisions of PCT Article 33(2)-(4) ..... \$100.00

CALCULATIONS | PTO USE ONLY

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months  
from the earliest claimed priority date (37 CFR 1.492(e)).

\$

Claims	Number Filed	Number Extra	Rate
Total Claims	16 - 20 =	0	X \$18.00
Independent Claims	1 - 3 =	0	X \$80.00
Multiple dependent claim(s) (if applicable)			+ \$270.00

**TOTAL OF ABOVE CALCULATIONS =**

\$ 860.00

Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must  
also be filed. (Note 37 CFR 1.9, 1.27, 1.28).

\$

**SUBTOTAL =**

\$ 860.00

Processing fee of \$130.00 for furnishing the English translation later the ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

+

\$

**TOTAL NATIONAL FEE =**

\$ 860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property

+

\$

**TOTAL FEES ENCLOSED =**

\$ 860.00

Amount to be:  
refunded

\$

charged

\$ 860.00

- a. ☐ A check in the amount of \$\_\_\_\_\_ to cover the above fees is enclosed.
- b. ☒ Please charge my Deposit Account No. 11-0600 in the amount of \$860.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 11-0600. A duplicate copy of this sheet is enclosed.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

SIGNATURE

Kenyon & Kenyon  
One Broadway  
New York, New York 10004

Richard L. Mayer, Reg. No. 22,490

NAME

DATE



26646

PATENT TRADEMARK OFFICE

09/890706

[22750/493]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : Peter LAUER et al.  
Serial No. : To Be Assigned  
Filed : Herewith  
For : A SHOE, IN PARTICULAR A SHOE FOR SMALL CHILDREN  
Art Unit : To Be Assigned  
Examiner : To Be Assigned

Box PCT  
Assistant Commissioner  
for Patents  
Washington, D.C. 20231  
Attn: DO/EO/US

**PRELIMINARY AMENDMENT AND  
37 C.F.R. § 1.125 SUBSTITUTE SPECIFICATION STATEMENT**

SIR:

Please, without prejudice, amend the above-identified application before examination, as set forth below.

**IN THE SPECIFICATION AND ABSTRACT:**

In accordance with 37 C.F.R. § 1.121(b)(3), a Substitute Specification (including the Abstract, but without claims) accompanies this response. It is respectfully requested that the Substitute Specification (including Abstract) be entered to replace the Specification of record.

**IN THE CLAIMS:**

Without prejudice, please cancel original claims 1-11 and substitute claims 1-10, and please insert new claims 12-27 as follows:

--12. (New) A shoe for promoting a heel-to-toe motion of a foot, the shoe comprising:

an outsole;

an upper part;

wherein the outsole has a contraction, the contraction extending to a first area where a back of the foot is located;

wherein a heel guide for a heel of the foot is provided in the upper part, the heel guide having one of a heelplate and a flexible heel brace;

wherein the one of the heelplate and the flexible heel brace are arranged in a second area where the heel of the foot is located;

wherein the one of the heelplate and the flexible heel brace are such that a Achilles tendon of the foot is free.

13. (New) The shoe according to claim 12,

wherein the contraction in the outsole is in a third area between where a forefoot of the foot is located and where the back of the foot is located;

14. (New) The shoe according to claim 12,

wherein, the outsole has a connecting area adjacent to the contraction.

15. (New) The shoe according to claim 14,

wherein, the connecting area has a flexibility such that a torsion of a forefoot with respect to the back of the foot is impeded as little as possible.

16. (New) The shoe according to claim 12,

wherein, in a fourth area where a forefoot is located, the outsole has a profiling, the profiling providing for a great flexibility of the outsole with regard to the heel-to-toe motion of the foot.

17. (New) The shoe according to claim 12,

wherein the shoe is a shoe for small children.

18. (New) The shoe according to claim 16,

wherein the profiling has one of parallel grooves and ray-shaped grooves, the one of the parallel grooves and the ray-shaped grooves extending at least partially over a width of the shoe.

19. (New) The shoe according to claim 18,

wherein the one of the parallel grooves and the ray-shaped grooves extend over the entire width of the shoe.

20. (New) The shoe according to claim 16,

wherein the profiling is made up of at least two materials having different elasticities.

21. (New) The shoe according to claim 12,

wherein the contraction of the outsole is arranged on an inner side of the shoe.

22. (New) The shoe according to claim 12,

wherein the contraction of the outsole is arranged on an outer side of the shoe.

23. (New) The shoe according to claim 21,

wherein the outsole has a further contraction, the further contraction being arranged on an outer side of the shoe.

24. (New) The shoe according to claim 12,

wherein the outsole has a thickness, the thickness being reduced to a minimum thickness required by conditions for manufacturing.

25. (New) The shoe according to claim 12,

wherein the outsole is provided with a heel in the first area.

26. (New) The shoe according to claim 18,

wherein the profiling is made up of at least two materials having different elasticities.

27. (New) The shoe according to claim 19,

wherein the profiling is made up of at least two materials having different elasticities.--

REMARKS

This Preliminary Amendment cancels without prejudice original claims 1-11 and substitute claims 1-10 in the underlying PCT Application No. PCT/EP00/00940, and adds without prejudice new claims 12-27. The new claims conform the claims to U.S. Patent and Trademark Office rules, and do not add new matter to the application.

In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. § 1.121(b)(3)(iii) and § 1.125(b)(2), a Marked Up Version Of The Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) is respectfully requested.

The underlying PCT Application No. PCT/EP00/00940 includes an International Search Report, mailed May 18, 2000. The Search Report includes a list of documents that were uncovered in the underlying PCT Application. A copy of the Search Report accompanies this Preliminary Amendment.

The underlying PCT application also includes an International Preliminary Examination Report and annexes thereto, dated May 4, 2001. An English translation of the International Preliminary Examination Report and annexes thereto is included herewith.

Applicants assert that the subject matter of the present application is new, non-obvious, and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully Submitted,  
KENYON & KENYON

Dated: 8/3/01

By: 

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2/PRTS

JC17 Rec'd PCT/PTO 03 AUG 2001  
09/890706

[22750/493]

A SHOE, IN PARTICULAR A SHOE FOR SMALL CHILDREN

FIELD OF THE INVENTION

The present invention relates to a shoe for promoting a heel-to-toe motion of a foot.

BACKGROUND INFORMATION

Already in German Patent C 10 70 962, it was established that the rotational mobility of the heel part of the sole with respect to the forward part of the sole, in the sense of a wringing, is essential for an undisturbed sequence of development of the foot. In addition, in that publication it is described as known that the insole and/or the outsole of the footwear are provided in the area of the articulated point with cutouts that proceed from the edges of the sole and that may be filled by inserts, which may be made of a more pliant material than that of the in- or outsole. In the area of the articulated point the width of the sole, which is furnished with the inserts, corresponds roughly to the dimensions that are established by the vertical projection of the foot, so that the foot is protected by the base of the shoe. The overall depth of these cutouts may be smaller than the overall width of the sole in the area of the articulation, the cutouts being wider in the area of the edge of the sole than in the area of the interior of the sole. In place of a single cutout, it may be also possible to assign to each edge of the sole a plurality of cutouts running roughly transverse to the longitudinal direction of the sole, whose edges, bordering a cutout, essentially run parallel to each other and whose width corresponds at least to the thickness of the sole.

On the upper side of the sole a molded footbed support may be arranged, which may be bonded in one piece to the material of the inserts that fill out the cutouts. The cutouts here may be situated mainly on the outer edge of the foot, so that the sole of the forward area of the foot is connected via a

roughly centered crosspiece to the outsole of the rear area of the foot.

From German Patent U 87 14 923, it is known to use anatomically shaped shoe soles, which are anatomically formed in a natural way in accordance with the imprint of a healthy foot and which can be used for all shoes. It can be seen from the drawing that the sole in the area of the transition between the heel and the forefoot may not be shaped in accordance with the outline of the foot, but rather in accordance with its contact surface. Therefore, in this area, there may be a reduction in the width. The problem of rotational mobility is not described.

From German Patent C 43 16 237, it is also known that a reinforcing element may be provided made of a fibrous material, which may be configured as a supporting plate and which also traces the foot contact surface in the area of the outer edge of the foot.

Despite the measures proposed here, it is believed that there remains a need for improvement in promoting unhindered physiological movement of the foot in all motions.

#### SUMMARY OF THE INVENTION

According to an exemplary embodiment of the present invention, the outsole in the area of the contraction has a connecting piece having a degree of flexibility such that a torsion of the front of the foot with regard to the back of the foot is impeded as little as possible, and high flexibility in the area of the front of the foot is provided to the outsole regarding the motion of the foot, as a result of an appropriate profiling.

It is believed that a combination of an increased rotational mobility in the heel part of the sole with respect to the forward part of the sole, together with a zone of high



flexibility in the ball of the foot area of the front of the foot, promotes the physiological heel to toe of the foot in all motions. In contrast to the related art, in which the flexibility is determined by the material selected and by the thickness of the sole, the flexibility of the sole according to an aspect of the above exemplary embodiment of the present invention is primarily achieved through the geometric configuration of the sole.

According to a further aspect of the above exemplary embodiment of the present invention, the contraction is be configured such that the area of the outsole in the front of the foot is connected via a crosspiece to the area of the outsole in the back of the foot. As a result, a single-piece injection-molding of the sole is possible.

It is believed that the above exemplary embodiment of the shoe according to the present invention is particularly suitable as a shoe for small children, because it supports the first steps of the small child while making possible the natural play of the toes, as a result of which the foot can move in a natural manner. It is further believed that the above exemplary embodiment of the shoe according to the present invention advantageously supports the development of the foot in a natural way and, especially as a shoe when learning to walk, promotes the first steps of a small child.

According to a further aspect of the above exemplary embodiment of the present invention, advantageously, the profiling is executed in the form of parallel or ray-shaped grooves, which extend at least partially over the width of the shoe.

According to a further aspect of the above exemplary embodiment of the present invention, the extension extends over the entire width of the shoe. It is believed that the extension over the entire width of the shoe is particularly

advantageous, allowing in a variant of this aspect of the above exemplary embodiment of the present invention the profiling to be made of a plurality of materials of differing elasticities. As a result, it is possible to increase the flexibility overall while maintaining the necessary minimum thickness for manufacturing the sole and for achieving a sufficient stability of the sole.

According to a further aspect of the above exemplary embodiment of the present invention, advantageously, the contraction of the outsole is arranged on the interior side of the shoe, because the movement of the foot in rolling from heel to toe is particularly pronounced in this area.

According to a further aspect of the above exemplary embodiment of the present invention, the contraction is extended into the area of the back of the foot, so that if a shoe heel is present, it is even partially chamfered. It is believed that a greater flexibility is achieved as a result.

According to a further aspect of the above exemplary embodiment of the present invention, the thickness of the outsole is advantageously reduced to the thickness required for manufacturing, which is believed to improve the flexibility. According to a further aspect of the above exemplary embodiment of the present invention, in addition to an anatomically shaped footbed, a heelplate or a flexible heel brace is provided for a heel guide, which is advantageously configured so that the Achilles tendon is free, which is believed to give the foot sufficient support despite the elastic sole.

According to a further aspect of the above exemplary embodiment of the present invention, the outsole in the area in the back of the foot has a heel, which is believed to improve the position of the foot. According to a variant of this aspect of the above exemplary embodiment of the present

invention, this heel extends under the heel bone of the child's foot in the direction of the forefoot and is narrowed in the area of the interior of the foot as a result of the contraction.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, a children's shoe according to exemplary embodiments of the present invention is depicted. The following are the contents:

10

Figure 1 shows an exemplary embodiment of a children's shoe according to the present invention in a view from below.

15

Figure 2 shows the children's shoe from Figure 1 in a side view emphasizing a reinforced heel area.

Figure 3 shows a further exemplary embodiment of a children's shoe according to the present invention in a view from below.

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Figure 4 shows an enlargement of the sole of the children's shoe from Figure 3 in a side view.

#### DETAILED DESCRIPTION

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Figure 1 depicts the lower side of a outsole 1. Outsole 1 is subdivided into an area in the forefoot 2 and an area in the back of the foot 3, which are connected to each other by a connecting area 4. Connecting area 4 arises as a result of a contraction 5 on interior side 6 of foot 7, whose contour is indicated by dotted line. Also running along this dotted-line contour is the undepicted upper part, that extends underneath the foot, so that in the area of contraction 5 the upper part is without any covering from below by sole 1.

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In area 3 in the back of the foot, a heel 8 is arranged, which is partially cut out in the area of contraction 5. Heel 8 offers protection against slipping in climbing or going up stairs. In area 2 in the forefoot, a profiling 9 is provided, which extends from presupposed position 10 of the ball of the

foot on interior side 6 of the foot to the exterior side of the foot.

Due to contraction 5, connecting area 4 is configured in a reduced width with respect to the projection surface of the foot, and in the depicted exemplary embodiment it is narrowed only on interior side 6 of the foot. However, it is advantageous to provide an appropriate contraction also on the exterior side of the foot. In this way, a connecting piece between the area of the forefoot and the area of the back of the foot arises.

In order to assure the foot sufficient support in the shoe despite the very flexible outsole, a heelplate or stiffener 21 is provided, which is depicted in Figure 2 and which is arranged in an upper part 22, the heelplate extending downwards in the area of the Achilles tendon, so that the Achilles tendon is free, the heelplate nevertheless being pulled up in the area of the front of the heel bone and extending beyond heel 8 to the exterior edge of the foot. Alternatively, a heel brace arranged on the exterior can also be used to generate an improved connection of the shoe to the foot in the heel area.

The children's shoe depicted in Figure 3, in the area of the toe joint, i.e., at the transition between the middle of the foot and the toes, has a profiling 9, extending over the entire width, in the form of crosspieces 9.1-9.4 and grooves 10.1-10.5. Taken together with contraction 5, a shoe of great flexibility is achieved in this manner, which little hinders the torsion of the foot and otherwise favors the motion of the foot in the area of the forefoot.

In Figure 4, an enlargement of the sole of the children's shoe from Figure 3 is depicted in a side view of the exterior side of the shoe. Profiling 9 can be seen in the form of crosspieces 9.1-9.4 and grooves 10.1-10.5, which can be filled

at least partially by a second material. This embodiment has less bending resistance and therefore contributes to the plasticity while at the same time assuring a sufficient thickness of the sole for protecting the foot.

5

Crosspieces 9.1-9.4 widen in the direction of the exterior edge of the shoe, so that, over the width of the shoe, in response to the motion of the foot, the exterior edge of the shoe has less bending resistance in the sole than the interior edge of the shoe.

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Beginning from heel 8, the thickness of the sole decreases not only as a result of the contraction, which is not visible in this representation, but also as a result of the reduction in the thickness of the sole in area 11.

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It is furthermore essential for comprehending the exemplary embodiments of the present invention, that the upper part of the shoe in the area of contraction 5 on the lower side of the shoe remains free, i.e., not covered by the sole. In the area of the exterior side of the foot, it is possible to configure the contraction as an arch that is covered only by a thin layer of sole material.

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ABSTRACT OF THE DISCLOSURE

A shoe, having an outsole and an upper part that is connected thereto, the outsole in the area between the forefoot and the back of the foot having a contraction, does not of its own accord sufficiently promote the natural rolling motion of the foot when the foot is in motion and when the child takes its first steps.

The outsole in the area of the contraction has a connecting area having a degree of flexibility such that a torsion of the forefoot with respect to the back of the foot is impeded as little is possible, and that, in the area of the forefoot, the outsole is provided with a high degree of flexibility with respect to the motion of the foot as a result of a corresponding profiling. Thus the natural motion of the child's foot can be maintained, while simultaneously providing sufficient protection for the child's foot during walking.

[22750/493]

## A SHOE, IN PARTICULAR A SHOE FOR SMALL CHILDREN

~~Background of the Invention~~FIELD OF THE INVENTION

The present invention relates to a shoe, ~~in particular a shoe~~  
5 ~~for small children, which supports the development of the foot~~  
~~in a natural way and, especially as a shoe when learning to~~  
~~walk, promotes the first steps of a small child.~~

~~Related Art~~

10 for promoting a heel-to-toe motion of a foot.

BACKGROUND INFORMATION

15 Already in German Patent C 10 70 962, it was established that  
the rotational mobility of the heel part of the sole with  
respect to the forward part of the sole, in the sense of a  
wringing, is essential for an undisturbed sequence of  
development of the foot. In addition, in that publication it  
is described as known that the insole and/or the outsole of  
the footwear are provided in the area of the articulated point  
20 with cutouts that proceed from the edges of the sole and that  
~~are~~may be filled by inserts, which ~~are~~may be made of a more  
pliant material than that of the in- or outsole. In the area  
of the articulated point the width of the sole, which is  
furnished with the inserts, corresponds roughly to the  
25 dimensions that are established by the vertical projection of  
the foot, so that the foot is protected by the base of the  
shoe. The overall depth of these cutouts ~~can~~may be smaller  
than the overall width of the sole in the area of the  
articulation, the cutouts being wider in the area of the edge  
30 of the sole than in the area of the interior of the sole. In  
place of a single cutout, it ~~is~~may be also possible to assign  
to each edge of the sole a plurality of cutouts running  
roughly transverse to the longitudinal direction of the sole,  
whose edges, bordering a cutout, essentially run parallel to

each other and whose width corresponds at least to the thickness of the sole.

On the upper side of the sole ~~is arranged~~ a molded footbed support may be arranged, which ~~can~~may be bonded in one piece to the material of the inserts that fill out the cutouts. The cutouts here ~~are~~may be situated mainly on the outer edge of the foot, so that the sole of the forward area of the foot is connected via a roughly centered crosspiece to the outsole of the rear area of the foot.

From German Patent U 87 14 923, it is known to use anatomically shaped shoe soles, which are anatomically formed in a natural way in accordance with the imprint of a healthy foot and which can be used for all shoes. It can be seen from the drawing that the sole in the area of the transition between the heel and the forefoot ~~is~~may not be shaped in accordance with the outline of the foot, but rather in accordance with its contact surface. Therefore, in this area, there ~~is~~may be a reduction in the width. The problem of rotational mobility is not described.

From German Patent C 43 16 237, it is also known ~~to provide that~~ a reinforcing element may be provided made of a fibrous material, which ~~is~~may be configured as a supporting plate and which also traces the foot contact surface in the area of the outer edge of the foot.

Despite the measures proposed here, it is believed that there remains a need for improvement in promoting unhindered physiological movement of the foot in all motions.

~~Presentation of the Invention~~

#### SUMMARY OF THE INVENTION

According to an exemplary embodiment of the present invention, the outsole in the area of the contraction has a connecting



piece having a degree of flexibility such that a torsion of the front of the foot with regard to the back of the foot is impeded as little as possible, and high flexibility in the area of the front of the foot is provided to the outsole regarding the motion of the foot, as a result of an appropriate profiling.

~~As a result of the~~ It is believed that a combination of an increased rotational mobility in the heel part of the sole with respect to the forward part of the sole, together with a zone of high flexibility in the ball of the foot area of the front of the foot, promotes the physiological heel to toe of the foot ~~is promoted~~ in all motions. In contrast to the related art, in which the flexibility is determined by the material selected and by the thickness of the sole, the flexibility of the sole according to an aspect of the above exemplary embodiment of the present invention is primarily achieved through the geometric configuration of the sole.

~~In this context~~ According to a further aspect of the above exemplary embodiment of the present invention, the contraction canis be configured such that the area of the outsole in the front of the foot is connected via a crosspiece to the area of the outsole in the back of the foot. As a result, a single-piece injection-molding of the sole is possible.

~~It is believed that the above exemplary embodiment of the shoe~~ according to the present invention is particularly suitable as a shoe for small children, because it supports the first steps of the small child while making possible the natural play of the toes, as a result of which the foot can move in a natural manner.

~~Advantageously~~ It is further believed that the above exemplary embodiment of the shoe according to the present invention advantageously supports the development of the foot in a

natural way and, especially as a shoe when learning to walk, promotes the first steps of a small child.

5 According to a further aspect of the above exemplary embodiment of the present invention, advantageously, the profiling is executed in the form of parallel or ray-shaped grooves, which extend at least partially over the width of the shoe. ¶

10 According to a further aspect of the above exemplary embodiment of the present invention, the extension extends over the entire width of the shoe. It is believed that the extension over the entire width of the shoe is particularly advantageous, allowing in a variant of this aspect of the  
15 above exemplary embodiment of the present invention the profiling ~~being able~~ to be made of a plurality of materials of differing elasticities. As a result, it is possible to increase the flexibility overall while maintaining the necessary minimum thickness for manufacturing the sole and for  
20 achieving a sufficient stability of the sole.

~~It is advantageous to arrange~~ According to a further aspect of the above exemplary embodiment of the present invention, advantageously, the contraction of the outsole is arranged on  
25 the interior side of the shoe, because the movement of the foot in rolling from heel to toe is particularly pronounced in this area.

~~¶~~ According to a further aspect of the above exemplary  
30 embodiment of the present invention, the contraction ~~can be~~ is extended into the area of the back of the foot, so that if a shoe heel is present, it is even partially chamfered. ¶ It is believed that a greater flexibility is achieved as a result.

35 ~~For improving the flexibility~~ According to a further aspect of the above exemplary embodiment of the present invention, the

thickness of the outsole is advantageously reduced to the thickness required for manufacturing. ~~In order to give the foot sufficient support despite the elastic sole, which is believed to improve the flexibility.~~ According to a further aspect of the above exemplary embodiment of the present invention, in addition to an anatomically shaped footbed, a heelplate or a flexible heel brace is provided for a heel guide, which is advantageously configured so that the Achilles tendon is free.

~~To improve the position of the foot, it is advantageous if, which is believed to give the foot sufficient support despite the elastic sole.~~

According to a further aspect of the above exemplary embodiment of the present invention, the outsole in the area in the back of the foot has a heel, which is believed to improve the position of the foot. ~~According to a variant of this aspect of the above exemplary embodiment of the present invention,~~ this heel extends under the heel bone of the child's foot in the direction of the forefoot and ~~can be~~ is narrowed in the area of the interior of the foot as a result of the contraction.

#### ~~Brief Description of the Drawing~~ BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, a children's shoe according to exemplary embodiments of the present invention is depicted. The following are the contents:

Figure 1 ~~depicts~~shows an exemplary embodiment of a children's shoe according to the present invention in a view from below.

Figure 2 ~~depicts~~shows the children's shoe from Figure 1 in a side view emphasizing a reinforced heel area.

Figure 3 ~~depicts~~shows a further exemplary embodiment of a

children's shoe according to the present invention  
in a view from below, ~~and.~~

Figure 4 ~~depicts~~shows an enlargement of the sole of the  
children's shoe from Figure 3 in a side view.

~~Execution of the Invention~~

DETAILED DESCRIPTION

Figure 1 depicts the lower side of a outsole 1. Outsole 1 is  
subdivided into an area in the forefoot 2 and an area in the  
back of the foot 3, which are connected to each other by a  
connecting area 4. Connecting area 4 arises as a result of a  
contraction 5 on interior side 6 of foot 7, whose contour is  
indicated by dotted line. Also running along this dotted-line  
contour is the undepicted upper part, that extends underneath  
the foot, so that in the area of contraction 5 the upper part  
is without any covering from below by sole 1.

In area 3 in the back of the foot, a heel 8 is arranged, which  
is partially cut out in the area of contraction 5. Heel 8  
offers protection against slipping in climbing or going up  
stairs. In area 2 in the forefoot, a profiling 9 is provided,  
which extends from presupposed position 10 of the ball of the  
foot on interior side 6 of the foot to the exterior side of  
the foot.

Due to contraction 5, connecting area 4 is configured in a  
reduced width with respect to the projection surface of the  
foot, and in the depicted exemplary embodiment it is narrowed  
only on interior side 6 of the foot. However, it is  
advantageous to provide an appropriate contraction also on the  
exterior side of the foot. In this way, a connecting piece  
between the area of the forefoot and the area of the back of  
the foot arises.

In order to assure the foot sufficient support in the shoe  
despite the very flexible outsole, a heelplate or stiffener 21

is provided, which is depicted in Figure 2 and which is arranged in an upper part 22, the heelplate extending downwards in the area of the Achilles tendon, so that the Achilles tendon is free, the heelplate nevertheless being pulled up in the area of the front of the heel bone and extending beyond heel 8 to the exterior edge of the foot. Alternatively, a heel brace arranged on the exterior can also be used to generate an improved connection of the shoe to the foot in the heel area.

The children's shoe depicted in Figure 3, in the area of the toe joint, i.e., at the transition between the middle of the foot and the toes, has a profiling 9, extending over the entire width, in the form of crosspieces 9.1-9.4 and grooves 10.1-10.5. Taken together with contraction 5, a shoe of great flexibility is achieved in this manner, which little hinders the torsion of the foot and otherwise favors the motion of the foot in the area of the forefoot.

In Figure 4, an enlargement of the sole of the children's shoe from Figure 3 is depicted in a side view of the exterior side of the shoe. Profiling 9 can be seen in the form of crosspieces 9.1-9.4 and grooves 10.1-10.5, which can be filled at least partially by a second material. This embodiment has less bending resistance and therefore contributes to the plasticity while at the same time assuring a sufficient thickness of the sole for protecting the foot.

Crosspieces 9.1-9.4 widen in the direction of the exterior edge of the shoe, so that, over the width of the shoe, in response to the motion of the foot, the exterior edge of the shoe has less bending resistance in the sole than the interior edge of the shoe.

Beginning from heel 8, the thickness of the sole decreases not only as a result of the contraction, which is not visible in

this representation, but also as a result of the reduction in the thickness of the sole in area 11.

It is furthermore essential for comprehending the exemplary  
embodiments of the present invention, that the upper part of  
the shoe in the area of contraction 5 on the lower side of the  
shoe remains free, i.e., not covered by the sole. In the area  
of the exterior side of the foot, it is possible to configure  
the contraction as an arch that is covered only by a thin  
layer of sole material.

09890705-103901  
T0920T-90205850

Abstract

~~A shoe, in particular a children's shoe,~~ ABSTRACT OF THE  
DISCLOSURE

5 A shoe, having an outsole ~~(1)~~ and an upper part ~~(22)~~ that is  
connected thereto, the outsole ~~(1)~~ in the area between the  
forefoot ~~(2)~~ and the back of the foot ~~(3)~~ having a contraction  
10 ~~(5)~~, does not of its own accord sufficiently promote the  
natural rolling motion of the foot when the foot is in motion  
and when the child takes its first steps.

15 ~~As a result of the fact that t~~The outsole ~~(1)~~ in the area of  
the contraction ~~(5)~~ has a connecting area ~~(4)~~ having a degree  
of flexibility such that a torsion of the forefoot with  
respect to the back of the foot is impeded as little is  
possible, and that, in the area ~~(10)~~ of the forefoot ~~(2)~~, the  
20 outsole ~~(1)~~ is provided with a high degree of flexibility with  
respect to the motion of the foot as a result of a  
corresponding profiling ~~(9)~~,. Thus the natural motion of the  
child's foot can be maintained, while simultaneously providing  
sufficient protection for the child's foot during walking.

~~(Figure 1)~~

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## A SHOE, IN PARTICULAR A SHOE FOR SMALL CHILDREN

### Background of the Invention

The present invention relates to a shoe, in particular a shoe for small children, which supports the development of the foot in a natural way and, especially as a shoe when learning to walk, promotes the first steps of a small child.

### Related Art

Already in German Patent C 10 70 962, it was established that the rotational mobility of the heel part of the sole with respect to the forward part of the sole, in the sense of a wringing, is essential for an undisturbed sequence of development of the foot. In addition, in that publication it is described as known that the insole and/or the outsole of the footwear are provided in the area of the articulated point with cutouts that proceed from the edges of the sole and that are filled by inserts, which are made of a more pliant material than that of the in- or outsole. In the area of the articulated point the width of the sole, which is furnished with the inserts, corresponds roughly to the dimensions that are established by the vertical projection of the foot, so that the foot is protected by the base of the shoe. The overall depth of these cutouts can be smaller than the overall width of the sole in the area of the articulation, the cutouts being wider in the area of the edge of the sole than in the area of the interior of the sole. In place of a single cutout, it is also possible to assign to each edge of the sole a plurality of cutouts running roughly transverse to the longitudinal direction of the sole, whose edges, bordering a cutout, essentially run parallel to each other and whose width corresponds at least to the thickness of the sole.

On the upper side of the sole is arranged a molded footbed



support, which can be bonded in one piece to the material of the inserts that fill out the cutouts. The cutouts here are situated mainly on the outer edge of the foot, so that the sole of the forward area of the foot is connected via a roughly centered crosspiece to the outsole of the rear area of the foot.

From German Patent U 87 14 923, it is known to use anatomically shaped shoe soles, which are anatomically formed in a natural way in accordance with the imprint of a healthy foot and which can be used for all shoes. It can be seen from the drawing that the sole in the area of the transition between the heel and the forefoot is not shaped in accordance with the outline of the foot, but rather in accordance with its contact surface. Therefore, in this area, there is a reduction in the width. The problem of rotational mobility is not described.

From German Patent C 43 16 237, it is also known to provide a reinforcing element made of a fibrous material, which is configured as a supporting plate and which also traces the foot contact surface in the area of the outer edge of the foot.

Despite the measures proposed here, there remains a need for improvement in promoting unhindered physiological movement of the foot in all motions.

#### Presentation of the Invention

According to the present invention, the outsole in the area of the contraction has a connecting piece having a degree of flexibility such that a torsion of the front of the foot with regard to the back of the foot is impeded as little as possible, and high flexibility in the area of the front of the foot is provided to the outsole regarding the motion of the foot, as a result of an appropriate profiling.

As a result of the combination of an increased rotational mobility in the heel part of the sole with respect to the forward part of the sole, together with a zone of high flexibility in the ball of the foot area of the front of the foot, the physiological heel to toe of the foot is promoted in all motions. In contrast to the related art, in which the flexibility is determined by the material selected and by the thickness of the sole, the flexibility of the sole is primarily achieved through the geometric configuration of the sole.

In this context, the contraction can be configured such that the area of the outsole in the front of the foot is connected via a crosspiece to the area of the outsole in the back of the foot. As a result, a single-piece injection-molding of the sole is possible.

The shoe is particularly suitable as a shoe for small children, because it supports the first steps of the small child while making possible the natural play of the toes, as a result of which the foot can move in a natural manner.

Advantageously, the profiling is executed in the form of parallel or ray-shaped grooves, which extend at least partially over the width of the shoe. The extension over the entire width of the shoe is particularly advantageous, the profiling being able to be made of a plurality of materials of differing elasticities. As a result, it is possible to increase the flexibility overall while maintaining the necessary minimum thickness for manufacturing the sole and for achieving a sufficient stability of the sole.

It is advantageous to arrange the contraction of the outsole on the interior side of the shoe, because the movement of the foot in rolling from heel to toe is particularly pronounced in this area.

The contraction can be extended into the area of the back of the foot, so that if a shoe heel is present, it is even partially chamfered. Greater flexibility is achieved as a result.

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For improving the flexibility, the thickness of the outsole is advantageously reduced to the thickness required for manufacturing. In order to give the foot sufficient support despite the elastic sole, in addition to an anatomically shaped footbed, a heelplate or a flexible heel brace is provided for a heel guide, which is advantageously configured so that the Achilles tendon is free.

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To improve the position of the foot, it is advantageous if the outsole in the area in the back of the foot has a heel. This heel extends under the heel bone of the child's foot in the direction of the forefoot and can be narrowed in the area of the interior of the foot as a result of the contraction.

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#### Brief Description of the Drawing

In the drawing, a children's shoe according to the present invention is depicted. The following are the contents:

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Figure 1 depicts a children's shoe according to the present invention in a view from below,

Figure 2 depicts the children's shoe from Figure 1 in a side view emphasizing a reinforced heel area,

Figure 3 depicts a further children's shoe according to the present invention in a view from below, and

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Figure 4 depicts an enlargement of the sole of the children's shoe from Figure 3 in a side view.

#### Execution of the Invention

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Figure 1 depicts the lower side of a outsole 1. Outsole 1 is subdivided into an area in the forefoot 2 and an area in the

back of the foot 3, which are connected to each other by a connecting area 4. Connecting area 4 arises as a result of a contraction 5 on interior side 6 of foot 7, whose contour is indicated by dotted line. Also running along this dotted-line contour is the undepicted upper part, that extends underneath the foot, so that in the area of contraction 5 the upper part is without any covering from below by sole 1.

In area 3 in the back of the foot, a heel 8 is arranged, which is partially cut out in the area of contraction 5. Heel 8 offers protection against slipping in climbing or going up stairs. In area 2 in the forefoot, a profiling 9 is provided, which extends from presupposed position 10 of the ball of the foot on interior side 6 of the foot to the exterior side of the foot.

Due to contraction 5, connecting area 4 is configured in a reduced width with respect to the projection surface of the foot, and in the depicted exemplary embodiment it is narrowed only on interior side 6 of the foot. However, it is advantageous to provide an appropriate contraction also on the exterior side of the foot. In this way, a connecting piece between the area of the forefoot and the area of the back of the foot arises.

In order to assure the foot sufficient support in the shoe despite the very flexible outsole, a heelplate or stiffener 21 is provided, which is depicted in Figure 2 and which is arranged in an upper part 22, the heelplate extending downwards in the area of the Achilles tendon, so that the Achilles tendon is free, the heelplate nevertheless being pulled up in the area of the front of the heel bone and extending beyond heel 8 to the exterior edge of the foot. Alternatively, a heel brace arranged on the exterior can also be used to generate an improved connection of the shoe to the foot in the heel area.

The children's shoe depicted in Figure 3, in the area of the toe joint, i.e., at the transition between the middle of the foot and the toes, has a profiling 9, extending over the entire width, in the form of crosspieces 9.1-9.4 and grooves 10.1-10.5. Taken together with contraction 5, a shoe of great flexibility is achieved in this manner, which little hinders the torsion of the foot and otherwise favors the motion of the foot in the area of the forefoot.

In Figure 4, an enlargement of the sole of the children's shoe from Figure 3 is depicted in a side view of the exterior side of the shoe. Profiling 9 can be seen in the form of crosspieces 9.1-9.4 and grooves 10.1-10.5, which can be filled at least partially by a second material. This embodiment has less bending resistance and therefore contributes to the plasticity while at the same time assuring a sufficient thickness of the sole for protecting the foot.

Crosspieces 9.1-9.4 widen in the direction of the exterior edge of the shoe, so that, over the width of the shoe, in response to the motion of the foot, the exterior edge of the shoe has less bending resistance in the sole than the interior edge of the shoe.

Beginning from heel 8, the thickness of the sole decreases not only as a result of the contraction, which is not visible in this representation, but also as a result of the reduction in the thickness of the sole in area 11.

It is furthermore essential for comprehending the present invention, that the upper part of the shoe in the area of contraction 5 on the lower side of the shoe remains free, i.e., not covered by the sole. In the area of the exterior side of the foot, it is possible to configure the contraction as an arch that is covered only by a thin layer of sole material.

What is claimed is:

1. A shoe, having an outsole (1) and an upper part (22) connected thereto, the outsole (1) having a contraction (5) in the area between the forefoot (2) and the back of the foot (3), the outsole (1) in the area of the contraction (5) having a connecting area (4) which has a flexibility such that a torsion of the forefoot with respect to the back of the foot is impeded as little as possible, and, in the area (10) of the forefoot (2), the outsole (1) being provided with great flexibility in response to the heel-to-toe motion of the foot, as a result of an appropriate profiling (9), wherein the contraction (5) of the outsole is extended into the area of the back of the foot and, in the upper part (22), a heelplate or a flexible heel brace (21) is provided for a heel guide, which is arranged in the heel area, while keeping the Achilles tendon free.

2. The shoe as recited in Claim 1, wherein the shoe is configured as a shoe for small children.

3. The shoe as recited in Claim 1 or 2, wherein the profiling has parallel or ray-shaped grooves (10), which extend at least partially over the width of the shoe.

4. The shoe as recited in Claim 3, wherein the grooves extend over the entire width of the shoe.

5. The shoe as recited in one of Claims 1 through 4, wherein the profiling is made up of at least two materials having different elasticities.

6. The shoe as recited in one of Claims 1 through 5, wherein the contraction (5) of the outsole is arranged on the inner side (6) of the shoe.

7. The shoe as recited in one of Claims 1 through 6,  
wherein the contraction (5) of the outsole is also optionally  
arranged on the outer side (9) of the shoe.

8. The shoe as recited in one of Claims 1 through 7,  
wherein the contraction (5) is extended into the area of the  
back of the foot.

9. The shoe as recited in one of Claims 1 through 8,  
wherein the thickness of the outsole (1) is reduced to the  
thickness required by the conditions for manufacturing.

10. The children's shoe as recited in one of Claims 1 through  
9, wherein the outsole (1) is provided with a heel (8) in the  
area of the back of the foot (2).

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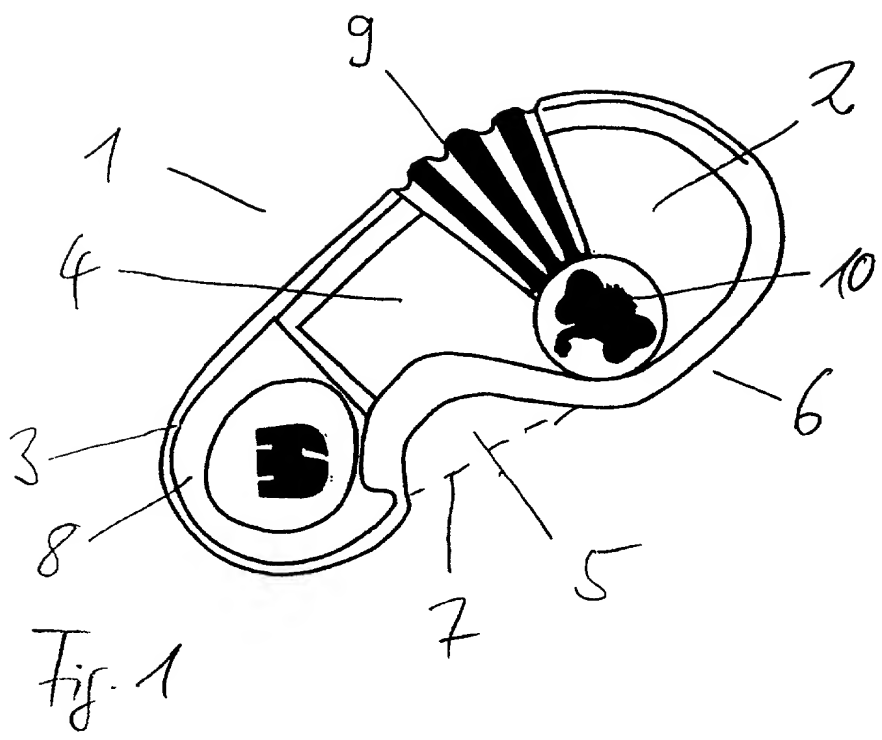


Fig. 1

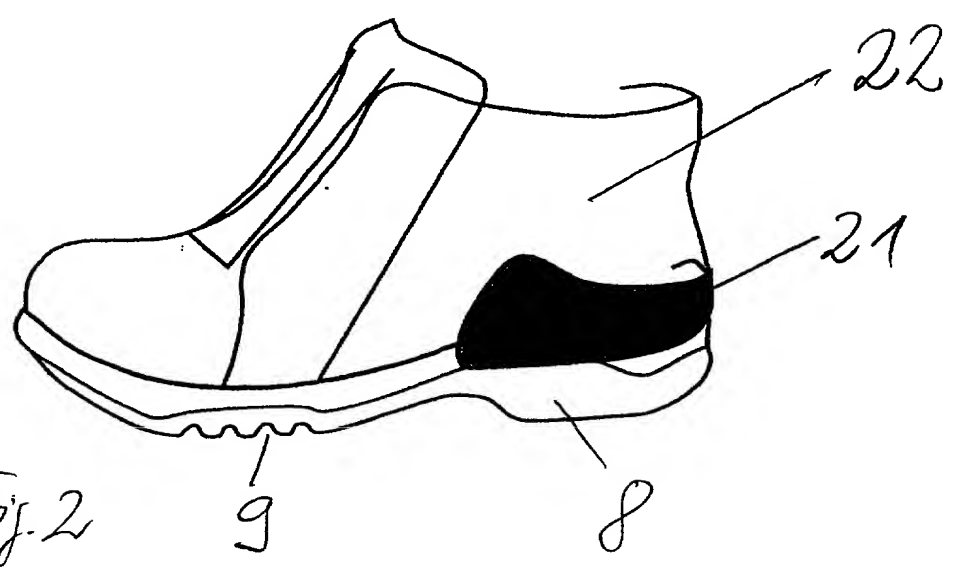


Fig. 2

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Fig. 3

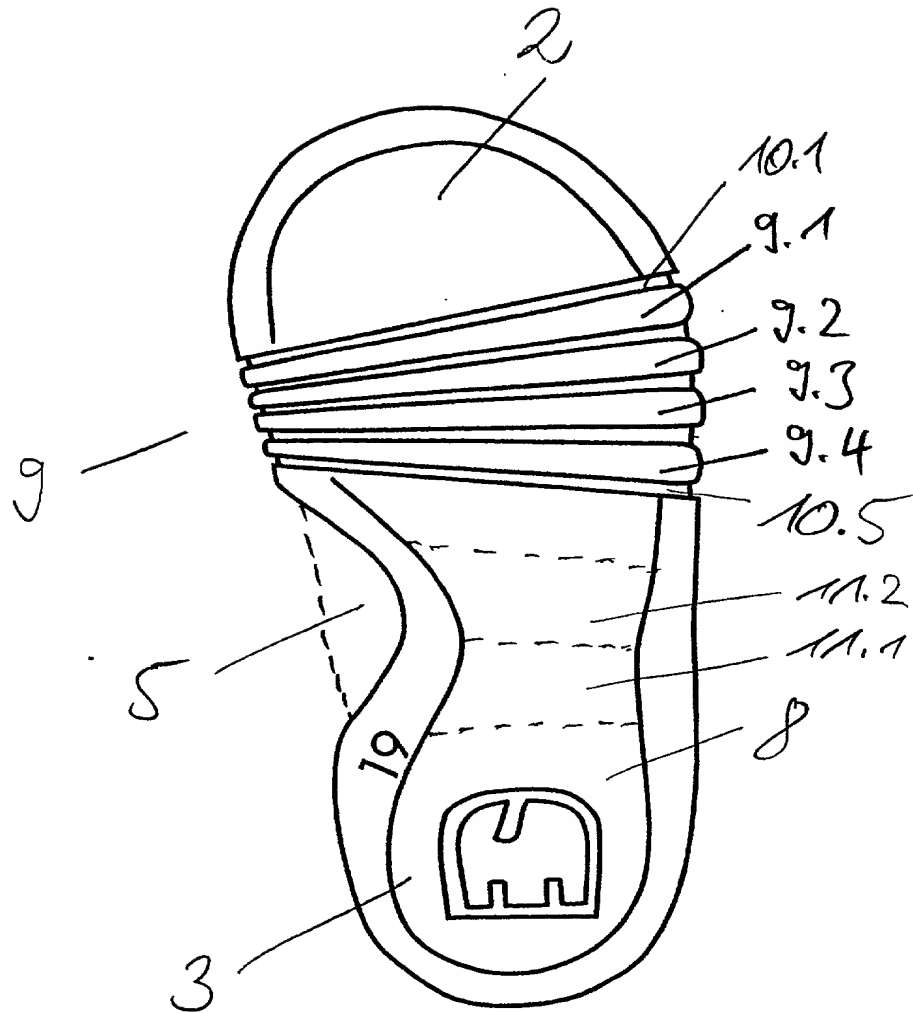
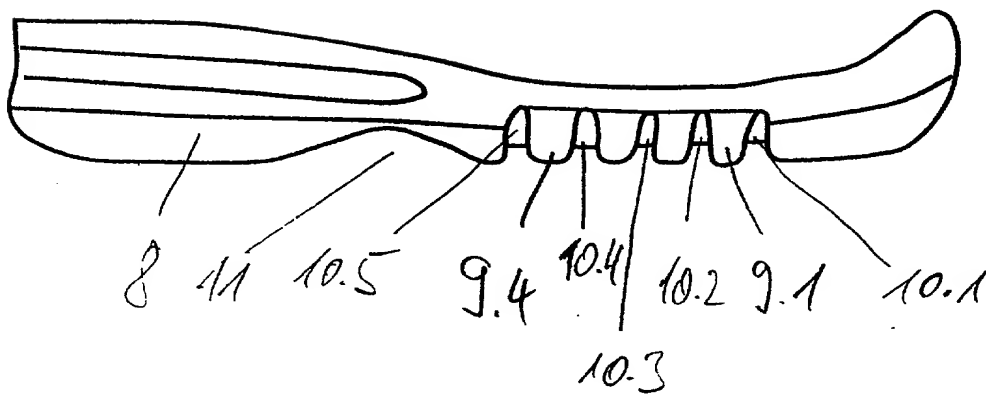


Fig. 4



U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

**DECLARATION AND POWER OF ATTORNEY**

ATTORNEY'S DOCKET NO.  
**22750/493**

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name,

I believe I am an original, first, and joint inventor of the subject matter that is claimed and for which a patent is sought on the invention entitled **A SHOE, IN PARTICULAR A SHOE FOR SMALL CHILDREN**, the specification of which was filed as International Application PCT/EP00/00940 on February 7, 2000.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

**PRIOR FOREIGN APPLICATION(S)**

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. § 119
<b>Federal Republic of Germany</b>	<b>199 04 887.8</b>	<b>6 February 1999</b>		<b>YES</b>

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorneys:

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**26646**  
PATENT TRADEMARK OFFICE

I understand and hereby acknowledge that the law firm of Kenyon & Kenyon ("K&K") represents the company to which rights in the invention have been or are being assigned and does not represent me or my interests as my attorney or otherwise (except to the extent that, in my capacity as employee or consultant, it is representing me by representing said company). Although a United States patent application is nominally filed and prosecuted in the U.S. Patent and Trademark Office in the name(s) of the inventor(s), I further understand that K&K has prepared a United States patent application relating to a A Shoe, In Particular A Shoe For Small Children that I invented on behalf of its client, not me, and that it will conduct the prosecution of that application and of any corresponding applications on behalf of its client, not me.

I declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful statements may jeopardize the validity of the application or any patent issuing thereon.

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